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(54) RETAINING STRUCTURE OF MOTOR ROTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a retaining structure of a motor rotor in which a bearing can be applied to both a metal bearing containing a oil impregnated product and a radial ball bearing, when a motor rotor fixing a rotating body to a motor shaft is supported rotatably with the bearing installed on a housing main body equipped with a stator.

SOLUTION: An annular trench part 10a for preventing lubricating oil from scattering is formed in a unified body by being stretched from a fixing base part 10 for a motor shaft 6 toward the metal bearing 5 and the radial ball bearing 20, and a spacer member 15 abutting against an inner ring 20a of the radial ball bearing 20 is made possible to be installed.

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## CLAIMS

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[Claim(s)]

[Claim 1] In the supporting structure of the motor rotator which supports to revolve the motor rotator which fixed body of revolution including a wing object to the motor shaft with the bearing prepared in the housing body equipped with the stator In order to enable application of said bearing to the both sides of the metal bearing and radial ball bearing containing the product made from oil impregnation sintering The circular-sulcus section for performing scattering prevention of a lubricating oil by being installed toward said bearing from the mounting base to said motor shaft of said motor rotator is really formed. And the supporting structure of the motor rotator characterized by enabling wearing of the spacing member which contacts the inner ring of spiral wound gasket of radial ball bearing inside said circular-sulcus section.

[Claim 2] The supporting structure of the motor rotator characterized by constituting so that it may equip with the spacing member which supports said body of revolution inside said circular-sulcus section in contact with the inner ring of spiral wound gasket of said radial ball bearing in the supporting structure of the motor rotator which supports to revolve the motor rotator which fixed body of revolution including a wing object to the motor shaft with the radial ball bearing

prepared in the housing body equipped with the stator and said body of revolution may be supported.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the supporting structure of a motor rotator, for example, relates to a technique applicable to a small fan motor.

[0002]

[Description of the Prior Art] The fan motor constituted so that the motor rotator which fixed body of revolution including a wing object to the motor shaft conventionally might be supported to revolve with the bearing of the housing body equipped with the stator is put in practical use.

[0003] There are a model which is the metal bearing in which bearing contains the product made from oil impregnation sintering according to this fan motor, and a model whose bearing is radial ball bearing.

[0004] And the motor rotator which fixed to the motor shaft 106 the mounting base 110 of the body of revolution which in the case of the model of metal

bearing includes a wing object as shown in the important section sectional view of drawing 4 (a) by insert molding While supporting to revolve with the metal bearing 105 of the housing body equipped with the stator In order that the lubricating oil which is transmitted and moves the motor shaft 106 may prevent dispersing according to the centrifugal force generated with a revolution, the structure of returning again the lubricating oil transmitted from the support section by setting a part to configuration section 110a of a earthenware mortar like a graphic display to a metal bearing side is adopted.

[0005] Moreover, in the case of the model which forms radial ball bearing 120 and the metal bearing 105 as bearing, as shown in the important section sectional view of drawing 4 (b), in order to give precompression to the inner ring of spiral wound gasket of radial ball bearing 120, it corresponds by preparing configuration section 110a like a graphic display.

[0006]

[Problem(s) to be Solved by the Invention] However, according to the conventional model, the motor rotator which formed the configuration section of dedication according to the model had to be prepared, exclusive metal mold had to be prepared in connection with this, and there was a problem used as complicated-izing of a production process and the factor of a cost rise.

[0007] Therefore, this invention is accomplished in view of the above-mentioned

trouble, and when supporting to revolve with the bearing of the housing body equipped with the stator the motor rotator which fixed body of revolution to the motor shaft, bearing aims at offer of the supporting structure of a motor rotator which can prevent complicated-izing and a cost rise of a production process by enabling application to the both sides of the model which is the model or radial ball bearing which is the metal bearing containing the product made from oil impregnation sintering.

[0008]

[Means for Solving the Problem] In the supporting structure of the motor rotator which supports to revolve the motor rotator which fixed body of revolution including a wing object to the motor shaft according to this invention in order to solve the technical problem mentioned above and to attain the object with the bearing prepared in the housing body equipped with the stator In order to enable application of said bearing to the both sides of the metal bearing and radial ball bearing containing the product made from oil impregnation sintering It is characterized by enabling wearing of the spacing member which really forms the circular-sulcus section for performing scattering prevention of a lubricating oil by being installed toward said bearing from the mounting base to said motor shaft of said motor rotator, and contacts the inner ring of spiral wound gasket of radial ball bearing inside said circular-sulcus section.

[0009] Moreover, in the supporting structure of the motor rotator which supports to revolve the motor rotator which fixed body of revolution including a wing object to the motor shaft with the radial ball bearing prepared in the housing body equipped with the stator, it is characterized by constituting so that it may equip with the spacing member which supports said body of revolution inside said circular-sulcus section in contact with the inner ring of spiral wound gasket of said radial ball bearing and said body of revolution may be supported.

[0010]

[Embodiment of the Invention] When it explains with reference to an attached drawing about 1 suitable operation gestalt of this invention below, drawing 1 is a central sectional view at the time of applying the supporting structure of the motor rotator of this invention to a brush loess axial flow fan motor.

[0011] In this Fig., it injection molds the housing body 1 made from Sadashige Tokoro fat ingredients, such as ABS plastics and polypropylene resin. Frame part 1b is continuously formed through the bearing bar from cylinder tubed base 1c, two or more opening 1a is fabricated between the above-mentioned base 1c and frame part 1b, and this housing body 1 is constituted so that the supplied air of the direction of arrow-head F may be performed through such opening 1a.

[0012] Moreover, although the oil impregnation sintering metal bearing 5 which is the radial bearing for supporting the motor shaft 6 to revolve, enabling a free



revolution is pressed fit and fixed to base 1c, after pressing a metal non-illustrated sleeve electrode holder fit in base 1c, the oil impregnation sintering metal bearing 5 may be pressed fit. Moreover, it replaces with the oil impregnation sintering metal bearing 5, and although it is more expensive than the metal bearing 5 as bearing, it is also possible to set the long radial ball bearing of continuation durable time amount mentioned later, or you may make it support the motor shaft 6 to revolve with the both sides of metal bearing and radial ball bearing, or two radial ball bearing in this base 1c.

[0013] On the other hand, the stator 11 which wound the coil 9 and was formed on the substrate The magnetic variation of the annular permanent magnet 8 which is being fixed by the approach of including adhesion in the housing body 1 focusing on base 1c like a graphic display, and is being fixed to the motor rotator 12 by the non-illustrated hall device and by which multi-electrode magnetization was carried out is detected. The brushless motor which generates rotating magnetic field, carries out magnetic attraction of the motor rotator 12, and performs revolution actuation by performing energization to a coil 9 based on this detection result is constituted.

[0014] Moreover, it is constituted in [ that insert molding is carried out to the mounting base 10 like a graphic display in the upper part of this motor shaft 6 while two or more wing section 10a is cast in one in the permanent magnet 8 by

which magnetic attraction is carried out to the motor shaft 6 which is supported to revolve free / a revolution by the oil impregnation sintering metal bearing 5 of the above / the motor rotator 12 /, for example, is manufactured from stainless steel specification rod part material, and the above-mentioned stator 11, and a peripheral face ] one.

[0015] And from the mounting base 10 to the motor shaft 6 of the motor rotator 12, circular-sulcus section 10a for performing scattering prevention of a lubricating oil toward the oil impregnation sintering metal bearing 5 is really fabricated. This circular-sulcus section 10a is formed in the configuration which has inner skin section 10b of a predetermined bore and chamfering-of-the-edge section 10c of a edge whose wearing of the spacing member which contacts the inner ring of spiral wound gasket of the radial ball bearing mentioned later is enabled, and 10f of peripheral face sections.

[0016] The vent which is open for free passage in 1d of closed-end sections and which is not illustrated is formed in a part of base 1c held on the other hand in the maintenance condition which pressed the oil impregnation sintering metal bearing 5 fit, and it enables it to miss outside the air which expanded by the temperature rise in 1d of closed-end sections of the housing body 1 through a vent.

[0017] Thus, before pressing the oil impregnation sintering metal bearing 5 fit in

base 1c and fixing to it, a clip 4 is set in 1d of closed-end sections of base 1c, and it is constituted so that the omission stop of the motor shaft 6 may be performed and it may be completed by entering into slot 6a by changing into the fitting condition of a graphic display.

[0018] Thus, while the thrust washer 3 with the lubricity made of the product made of nylon or Teflon (trademark) resin is arranged in 1d of closed-end sections of the lower part of the clip 4 for escaping from the motor shaft 6 and maintaining in the stop condition and supporting the load of the thrust direction of the motor shaft 6 by the thrust washer 3, it is constituted so that it may support by the above-mentioned oil impregnation sintering metal bearing 5 chiefly only about the load of the radial direction of the motor shaft 6.

[0019] On the other hand, when inserted in the above-mentioned oil impregnation sintering metal bearing 5, inclined plane 6b which counters inclined plane 5a formed in the edge of the support pore of the oil impregnation sintering metal bearing 5 is formed in the motor shaft 6, and the oil sump section of a lubricating oil is formed in it with these dip face-to-face.

[0020] Next, drawing 2 is the central sectional view of the brush loess axial flow fan motor which served as process drawing. In this Fig., if the sign same about a component part [ finishing / explanation / already ] is attached and explanation is omitted, inner skin section 10b of circular-sulcus section 10a is an inside

diameter  $d_2$ , and it is set up so that it may become less than [ of a spacing member 15 / outer-diameter dimension  $d_4$  ] in the process of an arrow head B.

[0021] Moreover, it is completed in the condition of contacting inner-ring-of-spiral-wound-gasket 20a of radial ball bearing 20 by making it become less than [ of a spacing member 15 / inside diameter  $d_3$  ], and a spacing member 15 being set like a graphic display by crosshatching in drawing again, and the diameter  $d_1$  of the motor shaft 6 is constituted so that pressurization may be given and the predetermined bearing engine performance may be secured.

[0022] On the other hand, in the process of an arrow head A, it changes into the support condition that the motor shaft 6 is alike oil impregnation sintering metal bearing 5 in the state of completion.

[0023] Since the response of bearing to the both sides of the model which is the model or radial ball bearing 20 which is the oil impregnation sintering metal bearing 5 is attained in the motor rotator 12 according to the above processes A and B when supporting a stator to revolve with the bearing of the housing body 1 which it had, complicated-izing and a cost rise of a production process can be prevented.

[0024] Moreover, in the sectional view of a model using the oil impregnation sintering metal bearing 5 of drawing 3 , the course is changed in the inner skin

section of circular-sulcus section 10a, and the lubricating oil which carried out propagation migration goes caudad, and can collect the motor shafts 6 now from an oil sump.

[0025] In addition, although the operation gestalt of explanation described only the brush loess axial flow fan motor above, it cannot be overemphasized that are not limited to this but this invention can be applied to the motor of various applications.

[0026]

[Effect of the Invention] As explained above, when supporting to revolve with the bearing of the housing body equipped with the stator the motor rotator which fixed body of revolution to the motor shaft according to this invention, the both sides of the model which is the model or radial ball bearing which is the metal bearing in which bearing contains the product made from oil impregnation sintering can be provided with the supporting structure of a motor rotator which can prevent complicated-izing and a cost rise of a production process by making application possible.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the central sectional view of a brush loess axial flow fan motor.

[Drawing 2] It is the important section sectional view which served as process drawing of the brush loess axial flow fan motor of drawing 1 .

[Drawing 3] It is the central sectional view of the motor using oil impregnation sintering metal bearing.

[Drawing 4] (a) and (b) are the central sectional views of the conventional fan motor.

[Description of Notations]

1 Housing Body

3 Thrust Washer

4 Clip

5 Oil Impregnation Sintering Metal Bearing

6 Motor Shaft

8 Permanent Magnet

10 Mounting Base

10a Circular-sulcus section

12 Motor Rotator

15 Spacing Member

20 Radial Ball Bearing